

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Protecting the Privacy of Customers of)	WC Docket No. 16-106
Broadband and Other Telecommunications)	
Services)	

REPLY COMMENTS OF NOKIA

Brian Hendricks
Jeffrey Marks
Nokia
1100 New York, Avenue, N.W.
Suite 705 West Tower
Washington, D.C. 20005

July 6, 2016

TABLE OF CONTENTS

	<u>PAGE</u>
I. SUMMARY	1
II. NOKIA IS AN INNOVATION LEADER IN NEXT GENERATION BROADBAND TECHNOLOGIES	2
III. PRIVACY RULES MUST NOT IMPEDE PROVISION OF A ROBUST BROADBAND SERVICE TO CONSUMERS.....	3
IV. ANY BROADBAND PRIVACY REGIME SHOULD ALWAYS PERMIT PROVIDERS TO USE AND SHARE DATA TO OPTIMIZE USER EXPERIENCE AND NETWORK PERFORMANCE	5
V. THE COMMISSION SHOULD NOT RESTRICT CONSUMER CHOICE WHETHER TO SHARE THEIR INFORMATION.....	9
VI. CONCLUSION.....	12

Attachment: Nokia Networks, Technology Vision 2020, Personalizing the Network Experience

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Protecting the Privacy of Customers of)	WC Docket No. 16-106
Broadband and Other Telecommunications)	
Services)	

REPLY COMMENTS OF NOKIA

Nokia submits these Reply Comments in response to the Notice of Proposed Rulemaking (“NPRM”) and initial comments submitted in the above-captioned proceeding.¹

I. SUMMARY

In this proceeding, the Commission for the first time proposes regulating the collection and use of customer information by broadband Internet access service (“BIAS”) providers. The initial comment phase provided a robust record for the Commission on the importance of consumer privacy and the legal and policy implications of the Commission’s proposals. Nokia responds to this record with a particular focus on the broadband network itself and the technology implications of the NPRM’s proposals.

After describing our leadership in network technologies, these Reply Comments caution against over-regulation of the network, in complete agreement with Commission Chairman Wheeler’s recent statements about the importance of “staying out of the way of technological development.”² The Commission should proceed with caution so it does not impede the virtuous cycle of innovation that it is trying promote.

¹*Protecting the Privacy of Customers of Broadband and Other Telecommunications Services*, Notice of Proposed Rulemaking, WC Docket No. 16-106, FCC 16-39 (rel. April 1, 2016) (“NPRM”).

² See *infra* page 4 & n.6.

These Reply Comments then review the exciting developments in intelligent networking, demonstrating the importance of using customer information to optimize network performance and the users' experience. Next, Nokia urges the Commission to allow informed choice by consumers to share their data in return for a benefit from the BIAS provider. In no event should the Commission engage in a comparative benefit analysis to evaluate the consideration provided to the customer versus the value a BIAS provider creates for itself through access to customer information. Nokia opposes this type of rate regulation and respectfully suggests that the Commission should hold to its repeated promises to not impose rate regulation on BIAS providers.

II. NOKIA IS AN INNOVATION LEADER IN NEXT GENERATION BROADBAND TECHNOLOGIES

Nokia is an innovation powerhouse, offering unparalleled leadership in the technologies that connect people and things. With Nokia's acquisition and integration of Alcatel-Lucent earlier this year, Nokia now possesses the capabilities and global scale to meet the extraordinary demands and opportunities of a world where everyone and everything is increasingly connected. Nokia is leveraging its strengths to create a new type of network that is intelligent, efficient, and secure, and which will serve as a critical enabler of many capabilities and use cases associated with the Internet of Things (IoT). We are weaving together the networks, data, and device technologies to create the universal fabric of our connected lives. In this new paradigm, new applications and data will flow without constraint, services and industry will automate and run seamlessly, and communities and businesses can rely on privacy, security, and near instant response times by connecting through the cloud. The role of analytics and data science in this world will be a significant contributor to the design of new infrastructure and services supporting the network and creating value to fuel investment and innovation.

Nokia brings together under one company mobile broadband with fixed line access, and the underlying IP routing and optical technology that connects them. Nokia has made pioneering advancements in reducing the footprint of mobile base station infrastructure, from compact yet full power macro sites down to the full range of “small cell” solutions, which are expected to be critical to enabling 5G deployment and the IoT. Nokia also offers the industry’s most comprehensive portfolio of services for integrating heterogeneous networks (“HetNets”), encompassing analysis, optimization, deployment, and management. With approximately 40,000 employees focused exclusively on research and development (“R&D”), and an expected spend of approximately \$4.5 Billion in 2016 on R&D, Nokia is well placed to play a leading role in shaping the new revolution in connectivity.

III. PRIVACY RULES MUST NOT IMPEDE PROVISION OF A ROBUST BROADBAND SERVICE TO CONSUMERS

While the most frequently discussed aspects of broadband and IoT are applications and edge devices, it is important to remember that none of these solutions would be possible without billions of dollars in investment in network infrastructure – both the R&D and the deployment of the breakthrough network technologies. Streaming video, by far the most popular use of broadband service today, is popular only because of the seamless experience provided by the underlying network. The fact that a grandparent can now watch live streaming video of their grandchild’s little league baseball game a thousand miles away is an example of the small ways today’s robust broadband networks strengthen our families and communities. People now take for granted the ease of online shopping, but this routine task can become a cumbersome chore if moving from screen to screen is riddled with delay.

These every-day examples do not even approach the mission critical services that rely on high quality connectivity for safety of life, but rather represent the consumer uses that we take for granted in accessing broadband content. This is possible because industry is constantly investing in improving the broadband experience. Similarly, the every-day

examples also understate the substantial need for the next generation of network technology to reduce latency to near zero and to greatly increase peak data rates in order to support zero failure tolerance use cases including autonomous driving vehicles, connected healthcare, and broadband data services to first responders.

Nokia is pleased with Chairman Wheeler's recent remarks where he recognized the importance of the network as the engine that drives the broadband economy. As the Chairman recently said in remarks on the future of wireless, "Leadership in networks leads to leadership in uses, which quickly moves across borders."³ The Chairman also stated the following in his recent speech stating that "5G must be a national priority:"⁴

We will be repeating the proven formula that made the United States the world leader in 4G: one, make spectrum available quickly and in sufficient amounts; two, give great flexibility to companies that can use the spectrum in expansive ways; and three, stay out of the way of technological development.⁵

Nokia applauds this statement of regulatory humility – an understanding that no one knows what the future will bring, especially in the lightening-fast field of technology development. But, what we do know is that, "[t]urning innovators loose is far preferable to expecting committees and regulators to define the future."⁶

It is against this backdrop that Nokia urges the Commission to proceed with great caution when seeking to layer onto broadband network providers a potentially restrictive regulatory regime that limits the information that can be accessed and how it can be used. Nokia believes it is particularly important for the Commission to recognize that the mobile broadband ecosystem, from the devices, application and services level all the way down to equipment design and network management activities, requires access to an array of

³ Prepared Remarks of FCC Chairman Tom Wheeler, The Future of Wireless: A Vision for U.S. Leadership in a 5G World, National Press Club, Washington, D.C at 3 (rel. June 20, 2016).

⁴ *Id.* at 1.

⁵ *Id.* at 3.

⁶ *Id.*

information ranging from how and where devices and services are used to the experience of individual consumers using specific applications. There is no uniformity to the nature of information collected, how it is utilized, how it is processed and stored, or how it is safeguarded. Therefore, as detailed further below, it is imperative that the Commission avoids the adoption of bright line rules that approach the ecosystem as if such uniformity does, or even can exist.

Through this comment cycle, through discussion with industry experts and participants, and through robust technical and economic analysis, the Commission must identify the range of business models, practices, and uses potentially impacted by the adoption of broadband privacy rules. Only through such careful analysis can the Commission ensure that it accounts for the manner in which certain proposals such as opt-out or opt-in may impact value creation in different industry segments and thereby avoid unintentionally discouraging innovation through the creation of “one size fits all” style rules. It is also absolutely critical that the Commission account for the manner in which access to network and user-level data, both live and stored, assists operators and their suppliers in managing networks on a day-to-day basis.

IV. ANY BROADBAND PRIVACY REGIME SHOULD ALWAYS PERMIT PROVIDERS TO USE AND SHARE DATA TO OPTIMIZE USER EXPERIENCE AND NETWORK PERFORMANCE

Nokia supports broadband privacy rules that permit a BIAS provider to use and share information within its sole, unfettered discretion in order to provide broadband service and manage its network. The NPRM states that it proposes to:

always allow broadband providers to use and share customer data in order to provide broadband services (for example to ensure that a communication destined for a particular person reaches that destination) and for certain other purposes that make sense within the context of the broadband providers’ relationships with their customers without additional approval from the customer.⁷

⁷ NPRM at ¶ 18.

In interpreting the scope and extent that permissive use of customer information will be allowed for “‘services necessary to, or used in, the provision’ of broadband service,” the NPRM asks for guidance on the record.⁸

In this context – use of data to run a network – Nokia respectfully suggests that the Commission should take a hands-off approach and avoid prescriptive rules or narrow definitions that will tie carrier hands. Access to information on how customers use the network, where they take devices, applications they use, etc. are instrumental in knowing how to traffic shape, manage congestion and design future network equipment and practices. Indeed, network management is essential to provide the network functionality that consumers expect — from enforcing per-subscriber service-level agreements, to preventing harms to the network by malicious activities, such as Denial of Service attacks, to ensuring the requisite security of virtual private networks. Consumers will expect even greater “management” of networks with the increasing number of cloud services, and as their media, content and files are continually transmitted to, stored in, and retrieved from, the cloud.

Information on current network conditions or what may have caused an outage are not the only valuable diagnostic and management tools utilized to ensure network resilience, reliability, and efficiency. Radio access network (RAN) equipment is now capable of monitoring and allowing rapid response to specific conditions that applications running on the network experience. This capability allows the operator or network manager to make important decisions on traffic shaping and priority to contend with demand bubbles and ensure quality of service to meet customer expectations. Application aware RAN can be an important tool in managing networks to ensure performance of applications and services to consumers, and it can also be a potential source of value creation for operators that are facing

⁸ NPRM ¶ 112. The Communications Act also recognizes the right to use customer information to “protect the rights of property of the provider, or to protect users and other providers from fraudulent, abusive, or unlawful use of, or subscription to, broadband services.” *See id.* ¶115 (citing 47 U.S.C. § 222(d)).

considerable revenue erosion. As noted earlier in these Reply Comments, emerging IoT use cases demand new network technologies and deployments, which in turn require investment by operators. Inflexible broadband privacy rules that may limit the utilization of such technologies could therefore cause harm on two fronts: network management and network evolution.

To expand on this concept, while some may suggest that the Commission should adopt rules that ensure that operators remain agnostic about the applications and services in use on their networks, it is clear that the applications and services themselves are not agnostic with respect to network conditions. Latency and packet loss are examples of potential network conditions that have significantly different impacts on high-bandwidth services like high-definition (or live) video, augmented reality, virtual reality, gaming, and health telemetry than they do on services like email, text messaging, or reading an article online. It is impractical and potentially destructive to ignore this reality and attempt to regulate the access to, and use of, data specific to applications and services that is critical to operators making rational real-time or near real-time network management decisions at “the speed of the user or application.” This is true for current generation networks, but as noted further below, it will be even truer for the networks of the future and a truly “connected world.” Nokia therefore believes the Commission should take a hands off approach, or better still consider exempting data essential to network management entirely from any opt-in or opt-out requirements that may be adopted in this proceeding.

To further underscore the importance of data analytics in networks of the future, Nokia submits with these Reply Comments, a White Paper entitled: “Technology Vision 20/20, Personalizing the Network Experience.”⁹ As described in the White Paper:

⁹ Nokia Networks, Technology Vision 2020, Personalizing the Network Experience (“Nokia White Paper”) (Attached).

“Personalizing the Network Experience” is the next step in this cognitive networks approach and allows decisions previously taken by humans to be performed at machine speeds and scales. In addition, machine learning and reasoning enables real-time optimization for each subscriber, based on customer experience management, privacy and business guidelines.

The approach entails processing massive amounts of data . . . , then analyzing the results to develop insights. This enables the operator to differentiate network traffic, the customer and the service. Additionally, business guidelines are developed to govern the real-time implementation of customer experience management in the network.¹⁰

The White Paper includes several use cases demonstrating how the Personalized Network Experience can improve service quality and network performance. For example, the White Paper discusses how this network management technology would benefit a customer who streams music every day on his drive to work. The White Paper describes a scenario where, by collecting user data over time, the network can recognize when a user is approaching a congested cell site, set a higher session priority for the user streaming music, while ensuring other consumers using more delay-tolerant applications do not notice any change to their service.¹¹ In order to optimize network performance for *everyone*, the network collects information on applications in use, commuting habits of customers, real-time geo-location, and many other factors.

This is a prime example of how data collection, and use of that information by a BIAS provider, is essential to management of broadband networks. This is the very definition of the statutory allowance for “use [of customer information] in the provision of broadband service.” As such, Nokia advocates that the Commission provide maximum flexibility to allow these network management tools to flourish. BIAS providers need all the tools they can muster to continually improve service and keep up with demand. The Commission should encourage, not stifle, the development of intelligent broadband networks.

¹⁰ Nokia White Paper at 6.

¹¹ *Id.* at 7-9.

V. THE COMMISSION SHOULD NOT RESTRICT CONSUMER CHOICE WHETHER TO SHARE THEIR INFORMATION

Nokia strongly opposes the NPRM's proposal to restrict the ability of consumers to enter into agreements with BIAS providers to allow use of their information in return for a benefit from those BIAS providers, financial or otherwise. This proscriptive approach to consumer choice in this proceeding echoes similar arguments from the Open Internet decision, and is a troubling trend. Chairman Wheeler was correct in the Open Internet proceeding that the Internet ecosystem is one characterized by a virtuous cycle of innovation. As we noted in that proceeding,¹² it is also true that innovation does not just happen at the edge of the network; indeed it must happen throughout the entire ecosystem for that cycle to continue. And, for innovation to happen throughout the entire ecosystem, the Commission must avoid policy frameworks that impose *ex ante* prohibitions on potential sources of value creation particularly when those prohibitions are imposed on only one segment of the ecosystem: once again, in this instance, providers of BIAS.

It is again important to note that innovation and investment in networks provide the foundation for everything else. For this reason, continuing to pursue policies that insert the Commission between the consumer and the service provider wherein consumers can benefit while creating value for the BIAS providers, in this case by having access to information that can assist in deployment decisions and monetization that facilitates additional investment, is a very bad and breathtakingly short sighted idea.

The NPRM states rather pejoratively that a consumer would be “surrendering his or her privacy rights” or “waiv[ing] their privacy rights” in entering into an agreement to provide access to certain of their data in exchange for something of value from the BIAS provider.¹³ Nokia both recognizes the value of customer data and the virtue in protecting that

¹² See Reply Comments of Nokia, GN Docket No. 14-28 (filed Sep. 14, 2014).

¹³ NPRM at ¶¶ 258, 263.

data through the development of disclosure and transparency requirements, but we believe that the customer should not be restricted from making an informed choice and gaining value from their own data as the Commission suggests. To be clear, customers' ability to share information with a service provider as they see fit is also a "right" that the Commission should not take away.

As the Commission recognizes, consumers regularly share data when engaging brick and mortar establishments and online service providers. Consumers are very much accustomed to providing information about themselves in order to obtain a benefit. Brick and mortar "loyalty programs" wherein a consumer's shopping preferences are tracked in exchange for discounts is a prime example of this. But, the broadband economy also runs on these types of programs. Indeed, consumers increasingly provide personal information in order to facilitate crowd sourcing applications such as Waze navigation. Consumers often have a choice of accessing content for free with advertising or purchasing a premium service that does not have advertising.

To date, Nokia has found no credible argument that suggests that there is a legal, policy, or competition-based reason to permit the free exchange of data for value in all of these other contexts, yet to prohibit it in the case of consumers and BIAS providers. Particularly, when as previously noted, this exchange could prove to be an essential source of value creation for BIAS providers that face revenue erosion from the loss of services to over the top providers and flat or falling return on capital employed (ROCE) that discourage investment. It is probably time for the Commission to recognize that there is a shared interest in ensuring that the entire Internet ecosystem—from consumer and device maker to the app provider, network operator and vendor—participate in the value chain. Doing so is what will ensure a favorable environment for innovation and investment in the networks that will be needed for IoT. And doing so will require that the Commission avoid continuing to insert

itself between the consumer and what he or she wants and the BIAS provider and what it can offer absent compelling evidence of consumer harm.

While deeply concerning standing alone, the possibility of the Commission *ex ante* prohibiting agreements between consumers and BIAS providers is not nearly as disturbing as the suggestion that the Commission may go one step farther. Despite repeated promises it will not do so, the Commission once again considers allowing consumers to share information with BIAS providers as long as the BIAS provider submits to potential rate regulation. Specifically, the Commission asks what it should do when “it appears that the provider is offering subscribers financial inducements to waive their privacy rights the value of which far exceed the value to the provider of the customers data”¹⁴ This comparative “value” analysis is rate regulation of broadband services, which Nokia opposes – full stop.

It should be up to the customer to determine how his or her data is valued, a very personal determination. It is completely understandable that a broadband customer (especially one who shares data regularly online), for example, may not place a high incremental value on sharing that data to receive a benefit from a broadband provider even if that broadband provider is able to obtain relatively high value from that data. From the consumers’ perspective, he or she is “getting a deal.”

But, the Commission proposes that customer satisfaction may not be enough. Rather, the Commission posits that it must then evaluate how much value the BIAS provider derived from that data compared to the value offered to the consumer. This is a dangerous course for many reasons, not the least of which is the problem of an “apples to oranges” comparison. The power of network intelligence, analytics and big data could very well result in substantial comparative value to broadband providers. This is not a bad thing. It can help drive continued massive investment in the broadband ecosystem, and in particular investment

¹⁴ NPRM at ¶ 263.

the networks that enable everything else—itself, a tremendous benefit to consumers. It is not at all clear how the Commission could objectively value the benefits to either the consumer or the BIAS provider. It is even less clear why the Commission believes it might be a good idea to try.

Nokia respectfully requests that the Commission dismiss the very notion that the Commission might conduct an inquiry where it would require carriers to open their books and quantify the value they derive from customer data versus the discount they provide the consumer. This would be rate regulation of broadband, just the type of utility-like paradigm that the Commission has repeatedly promised it would not impose, and which would stifle the fast-paced innovation U.S. consumers have come to expect.

VI. CONCLUSION

Nokia appreciates the opportunity to provide these Reply Comments and requests that the Commission adopt broadband privacy rules that are designed to provide BIAS providers broad discretion to use customer information to optimize network performance and create value that will drive continued network innovation and deployment.

Respectfully submitted,

Nokia

/s/

By: Brian Hendricks
Jeffrey Marks
Nokia
1100 New York, Avenue, N.W.
Suite 705 West Tower
Washington, D.C. 20005

July 6, 2016